City of Cambridge Analysis of Curbside & Drop-Off Programs

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Natalie Starr & Ted Siegler

DSM Environmental Services, Inc.


With Special Thanks To
Randi Mail

All The Other Great Sorters
(We couldn't have done it without you!)

- Rick Leandro
- Dawn Quirk
- Ben Crouch
- Judy Nathans
- Cornelia Herzfeld
- Justin Adams
- Rob Gogan
- Adam Mitchell

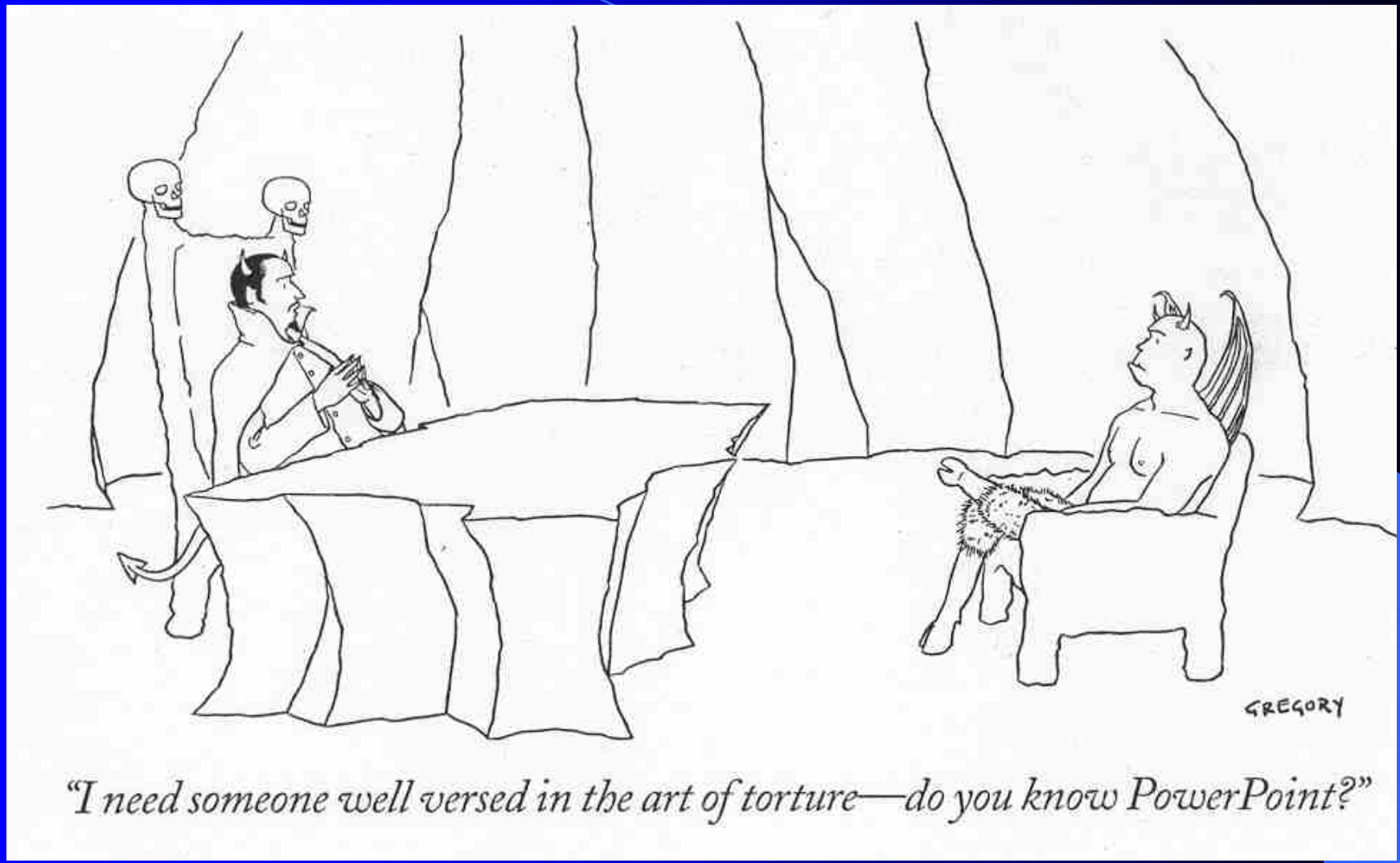
The Sanitation Division

F.W. Russell & Sons

We don’t have a picture because they did what they were supposed to do – Kept off the route until we finished collecting our sample!

And, KTI (FCR)
Who Gave Us:

- Use of their truck scales
- Scarce floor space for sorting
- Well improvised sorting tables
- Storage for our sorting equipment
- Skid steer loaders to move sorted material
- Free disposal of the sorted waste
- Use of their power washer



"I need someone well versed in the art of torture—do you know PowerPoint?"

Purpose

- Identify strategies to meet City's recycling goal given:
  - The composition of the waste stream
  - Current recovery/capture rates
  - The City's current financial and operational resources

This Presentation Focuses On:

- Capture Rate Analysis of Curbside Collection Program
- Analysis of Drop-Off Program

Capture Rate Analysis

What percent of recyclables that *could be set out for recycling* are being set out as *recyclables* as opposed to set out in the refuse?

Just To Be Clear

- Capture Rate:
  - Percent of recyclables set out for recycling by participating households only
- Recovery Rate:
  - Percent of recyclables set out for recycling by participating *and* non-participating households

Methodology

- Select representative routes in representative neighborhoods
- Randomly select refuse and recycling set-outs within those neighborhoods to sort

For the City of Cambridge

- Sampled from four routes chosen to **represent different characteristics** of Cambridge households:
  - **Tuesday:** high income, owner occupied
  - **Wednesday:** tenant occupied large apartment bldgs.
  - **Thursday:** 2-6 family, tenant occupied (lower income
  - **Friday:** 2-6 family tenant and owner occupied (middle income)

Please Keep In Mind As We Go Through This Presentation

The route day is only a placeholder for the **characteristics** of the households from which we sampled.

One each route
we collected all
the refuse and/or recyclables
from every sixth set-out


Whether it contained just
Recyclables


Or Just Refuse


Or Both Refuse and Recyclables

For Each Sample

- We recorded the number of households in the building
- We placed the recyclables in one truck
- We placed the refuse in a second truck

Once we had collected a sample from at least 50 households we drove to KTI, weighed and unloaded each truck separately

We sorted and weighed the recyclables, by material

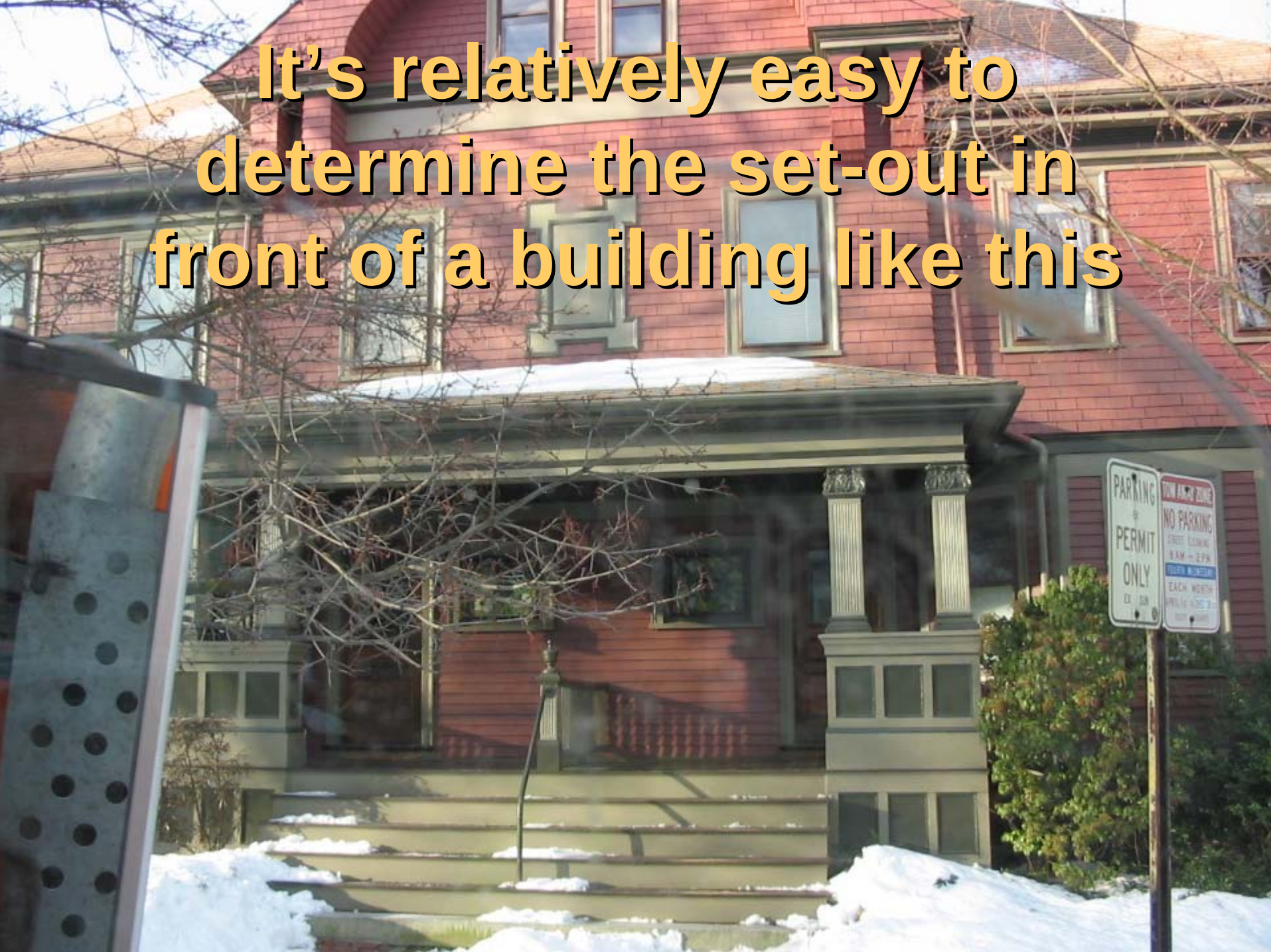

Then sorted through the garbage
pulling out all recyclables
(and a few other potentially
recyclable/reusable items),
weighing by material

The Results Allow Us To *Estimate*, For Each Route:

- Monthly Participation
- Recycling Rates
- Recovery Rates By Material
- And Most Importantly – Maximum Achievable Recovery Rates

Estimated Monthly Participation Rates

- Tuesday: 95%
- Wednesday: NA
- Thursday: 65%
- Friday: 65%


It’s relatively easy to determine the set-out in front of a building like this
PARKING PERMIT ONLY
NO PARKING


But impossible for this large apartment building with shared refuse and recycling containers

Estimated Recycling Rates

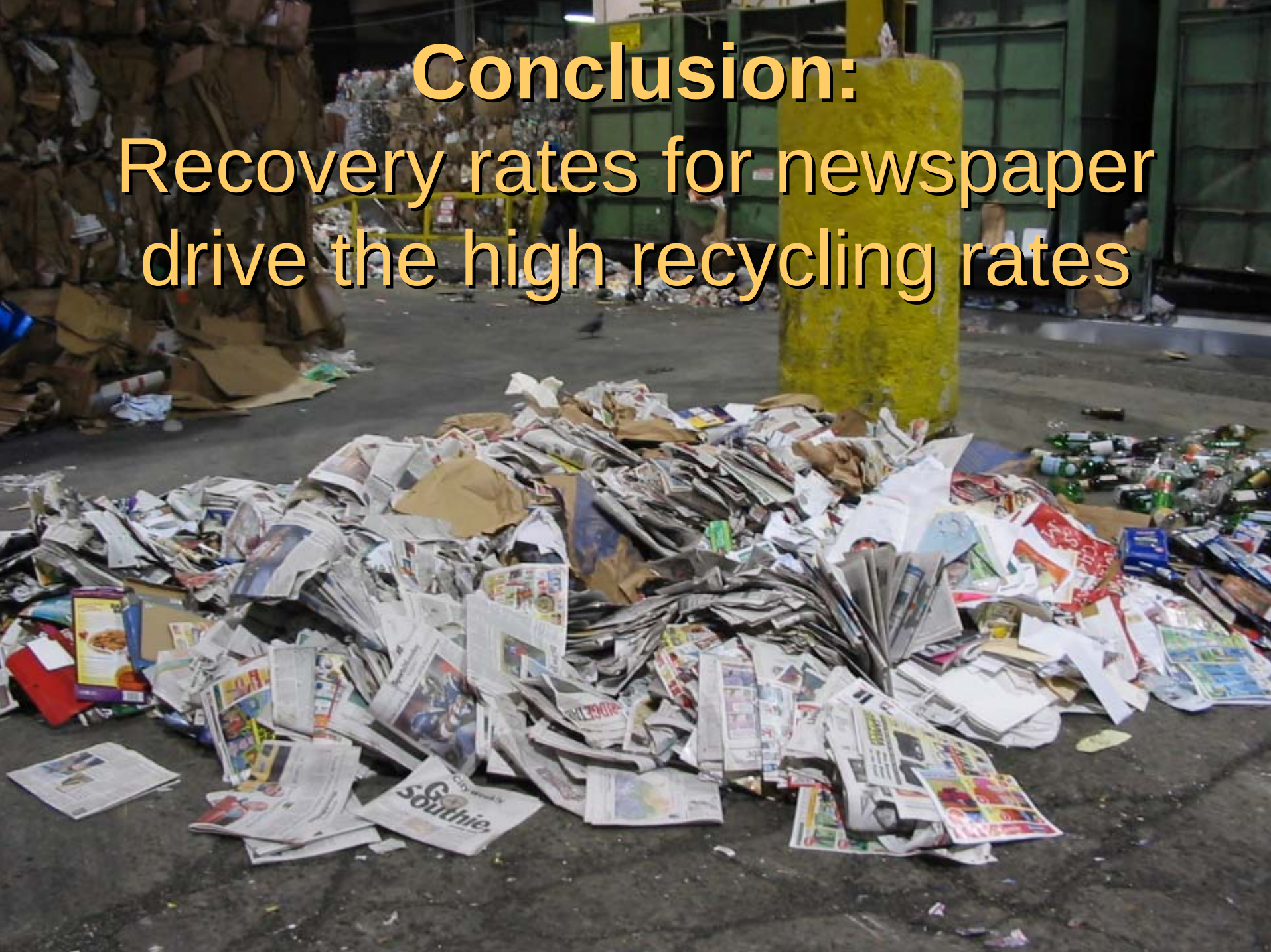
- Tuesday: 43%
- Wednesday: 36%
- Thursday: 16%
- Friday: 24%

But Recycling Rates Don’t Tell The Whole Story

Comparison Of Annualized Household Set-Outs and Recycling Rates

Day	Recycling (lbs)	Refuse (lbs)	Total (lbs)	Recycling Rate (%)
Tuesday	1,367	1,791	3,158	43%
Wednesday	320	570	890	36%
Thursday	273	1,576	1,848	15%
Friday	449	1,430	1,879	24%

Curbside Materials	Tuesday Recovery Rate (%)	Wednesday Recovery Rate (%)	Thursday Recovery Rate (%)	Friday Recovery Rate (%)
Paper				
OCC	**53%**	**57%**	**27%**	**73%**
ONP (1)	**91%**	**85%**	**56%**	**89%**
Mixed Paper, Magazines & Paper Cartons	**56%**	**55%**	**29%**	**56%**
Chipboard	**29%**	**36%**	**32%**	**42%**
Subtotal:	**73%**	**65%**	**35%**	**71%**
Containers				
Glass containers	**80%**	**70%**	**61%**	**72%**
Plastic Bottles	**75%**	**52%**	**46%**	**59%**
Plastic Containers (Marked)	**43%**	**27%**	**14%**	**12%**
Metal containers & foil	**61%**	**39%**	**24%**	**45%**
Subtotal:	**75%**	**60%**	**49%**	**60%**
Total curbside:	**74%**	**64%**	**38%**	**69%**


Conclusion:
Recovery rates for newspaper drive the high recycling rates


There is room for improvement with corrugated:
This corrugated will be thrown away!

As Well As Opportunities For:

- Mixed Paper
- Chipboard

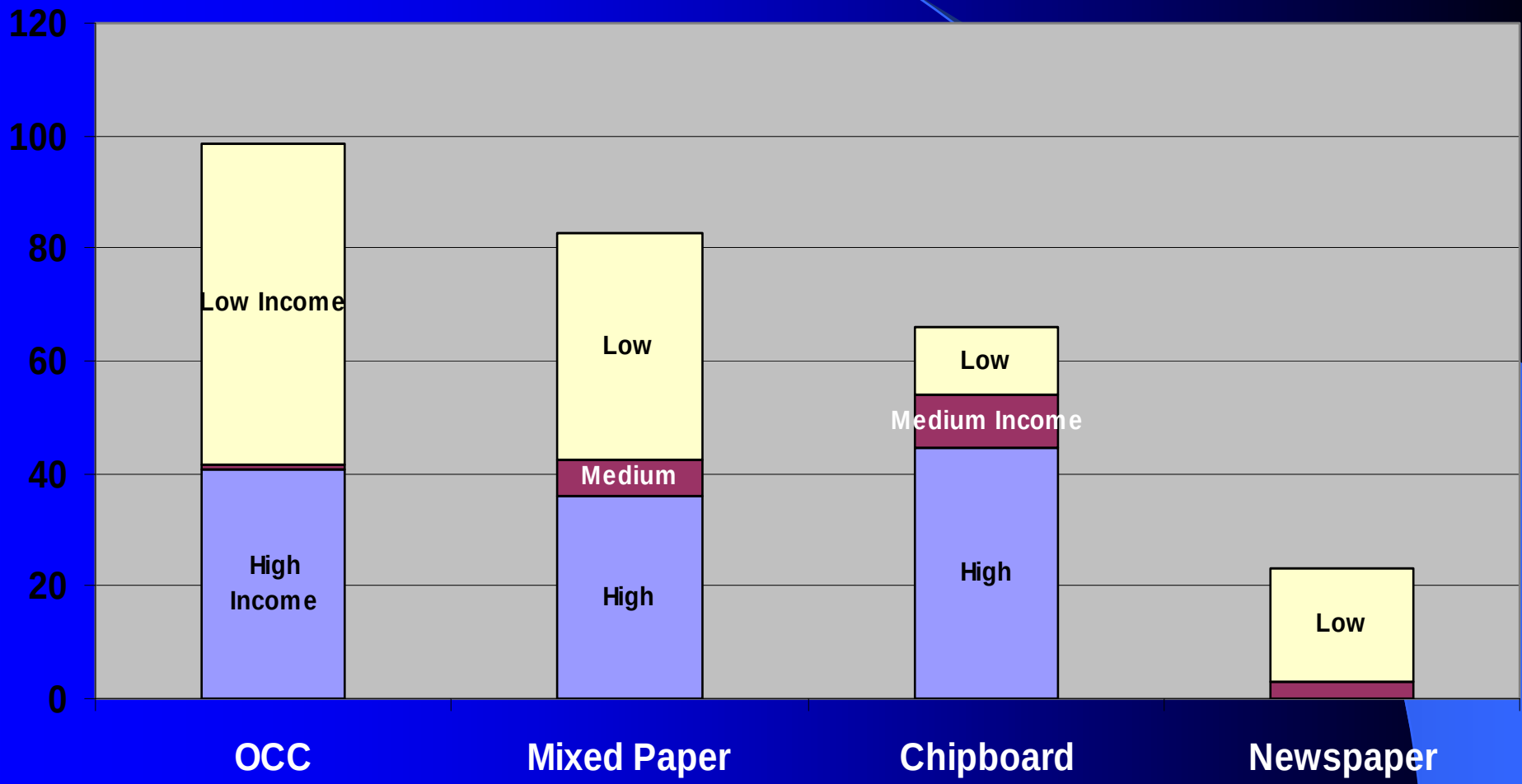
Maximum Achievable Recovery Rates

- Based on sort data from other communities around the country we have estimated maximum achievable recovery rates by material, by income level

Potential Increases in Lbs/HH/Yr, by income, here

Material	High (lbs)	Medim (lbs)	Low (lbs)
OCC	41	1	57
Mixed Paper	36	7	40
Chipboard	44	9	12
Newspaper	0	3	20
Total:	121	20	130

Potential for Recovery (Lbs/HH/Year) by Income Level



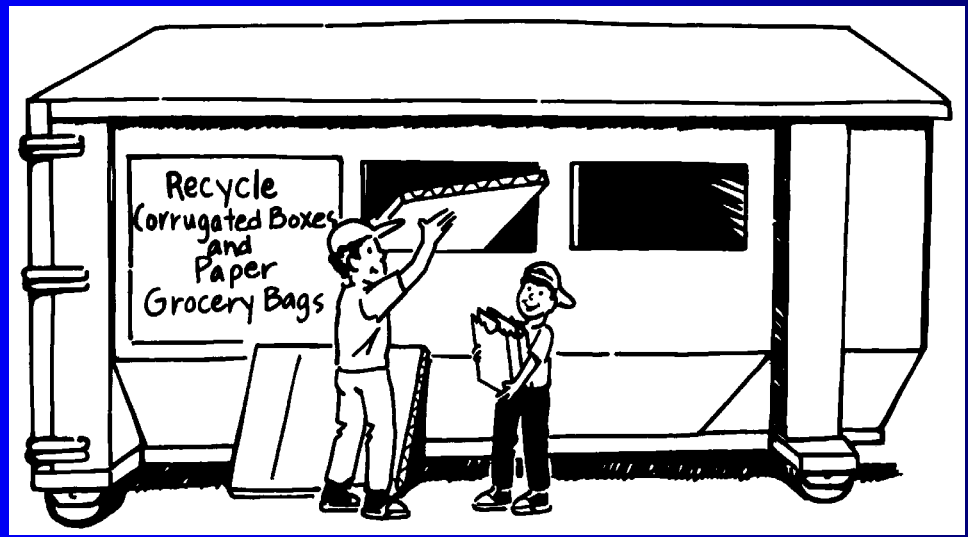
Estimated Increase in Annual Recovery By Income Level

Income	Households (#)	Lbs/HH/Yr (lbs)	Tons/Yr (tons)
High	12,422	121	752
Medium	23,546	20	235
Low	6,647	130	432
Total:	*42,615*	*NA*	*1419*

Improving Curbside Recycling

- Focus on high and low income households
- Focus especially on existing recyclers in high income areas
- Larger carts in high income areas
- Improved messages in high and lower income areas – especially with respect to mixed paper
- Require compaction trucks for recycling in next contract to encourage corrugated recycling

Analysis of Drop-Off Program



Tasks

- Evaluate history and use of drop-off
- Analyze costs for operation of the drop-off
- Evaluate need for drop-off based on capture rate studies
- Evaluate potential new materials that could be accepted at the drop-off
- Make recommendations to improve drop-off program

While the capture rate study focused on the curbside program, it also provided valuable information for analyzing the drop-off program.

Conclusions

- Materials accepted exclusively at the drop-off made up only 4% of all material set out by households
- This compares to 48% for curbside collected materials
- The capture rate study demonstrated that there are no additional materials that can be cost effectively added to the drop-off

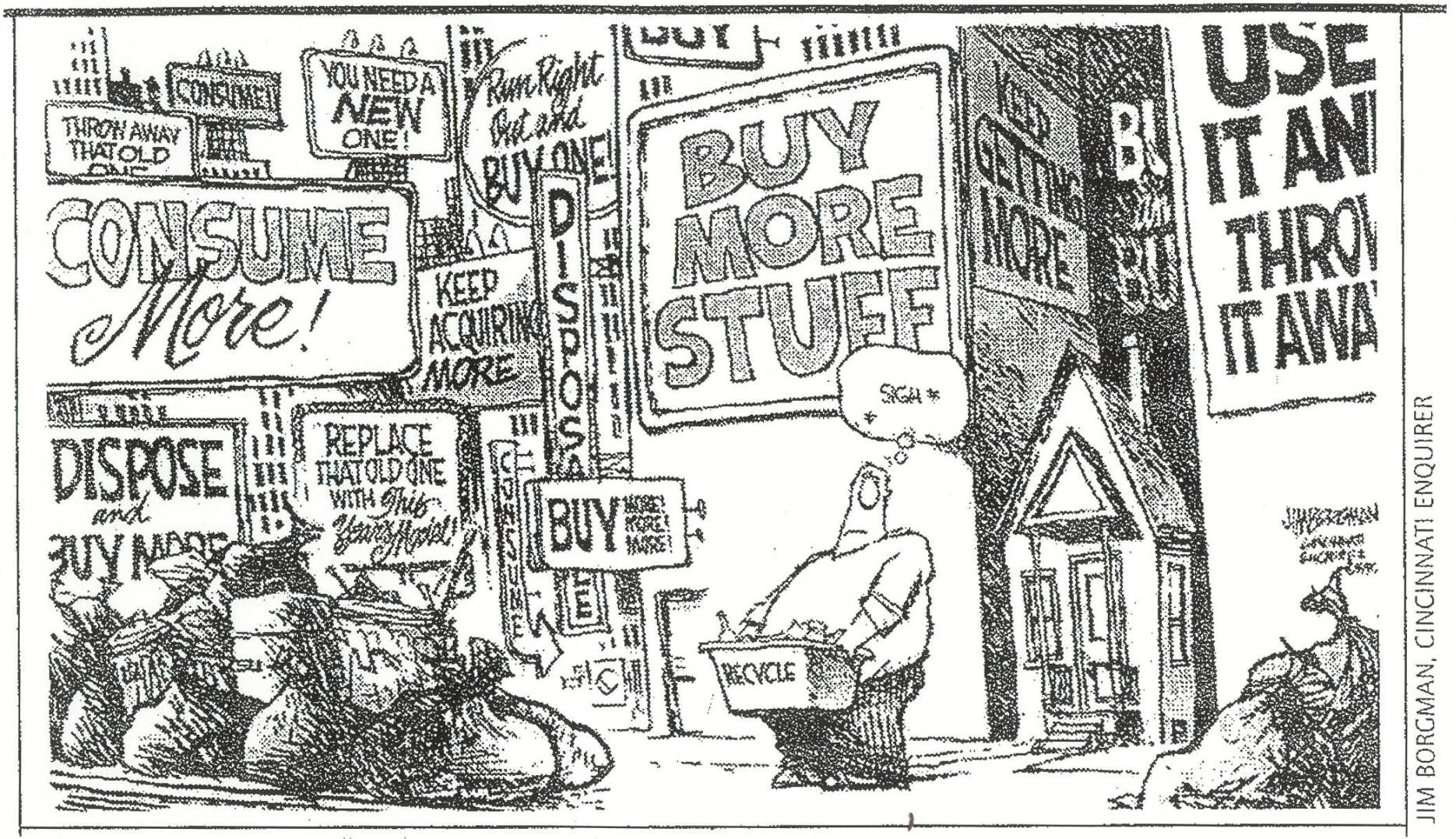

Plastic Film and Other Plastics
are the largest single category
of *Non-Curbside Material* (by weight)
delivered to the Drop-Off.

Cost Per Ton

- Curbside Collection: $100
- Drop-Off Collection: $300

Reasons to Keep Drop-Off

- A small portion of over-all Recycling Division budget ($65,000)
- Provides a convenient solution for small businesses
- Provides a solution for landfill banned wastes
- Provides an outlet for avid recyclers
- Can be an important educational tool


CONSUME
THROW AWAY THAT OLD ONE
YOU NEED A NEW ONE!
CONSUME More!
Run Right Out and BUY ONE!
KEEP ACQUIRING MORE
DISPOSE
BUY MORE STUFF
KEEP GETTING MORE
USE IT AN
THRO
IT AWA
DISPOSE and BUY MORE
REPLACE THAT OLD ONE WITH This Year's Model!
BUY
SIGH
RECYCLE
JIM BORGMAN, CINCINNATI ENQUIRER


SHOE JEFF MacNELLY
OKAY, I SEPARATED ALL OUR GARBAGE AND PUT IT OUT ON THE CURB.
BUT I'M STILL WONDERING IF THIS IS PROGRESS.
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TRASH
GLASS
PAPER
ALUMINUM
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Questions